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Zero Retries is an independent newsletter promoting technological innovation that is occurring in Amateur Radio, and Amateur Radio as (literally) a license to experiment with and learn about radio technology. Now in its third year of publication, with 1200+ subscribers.

About Zero Retries

Steve Stroh N8GNJ, Editor

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Web version of this issue - https://www.zeroretries.org/p/zero-retries-0137

Request To Send

Commentary by Editor Steve Stroh N8GNJ

Hamvention 2024, Ho!

Hamvention 2024 in Xenia, Ohio, USA countdown - ~~*19*~~ ~~*18*~~ ~~*17*~~ ~~*16*~~ *15 weeks!*

Zero Retries Paid Subscribers Update

My thanks to Paid Subscriber **Prefers to Remain Anonymous 19** as the newest Paid Subscriber to Zero Retries!

Financial support is a real vote of confidence for continuing to publish Zero Retries.

***Copious* Feedback from Zero Retries 0136**

In the six hours or so after **Zero Retries 0136** was published, I received an *absolutely delightful* stream of emails, messages, and comments on subjects discussed in that issue. My discussion of Radio *Active* Amateur Radio clubs, and Data Appliances apparently resonated with a number of Zero Retries readers. Because of a personal issue reducing my editing time for Zero Retries this week, I cannot do justice to all that great feedback in this issue, but I will do so in Zero Retries 0138 next week.

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Reimagining Amateur Radio Part 3 - More Data Appliances

By Steve Stroh N8GNJ and Bill Diaz KC9XG

Third in a series about how Amateur Radio could be reimagined / reconceptualized to be more relevant to younger techies in the 2020s and beyond and thus increase the numbers of Amateur Radio Operators and improve Amateur Radio's relevance to the general population.

*See Part 1 in **Zero Retries 0135**, and Part 2 in **Zero Retries 0136**.*

Just Another TCP/IP Device

One version of a Data Appliance I neglected to discuss in the two previous installments of this series is the idea of "keeping it all TCP/IP". If your Data Appliance is "just another TCP/IP device on your network", then you can use your usual (or dedicated) applications on your phone, tablet, or laptop to access your data appliance and Amateur Radio network services that use TCP/IP, all via your home network or a dedicated network. (Dedicated applications, for example, might include using the Thunderbird email application for your Amateur Radio email, and another email application for your personal or work email._

Two great examples of "keeping it all TCP/IP" are an Amateur Radio Emergency Data Network (AREDN) node, and a New Packet Radio (NPR) node (see next article). They share these attributes:

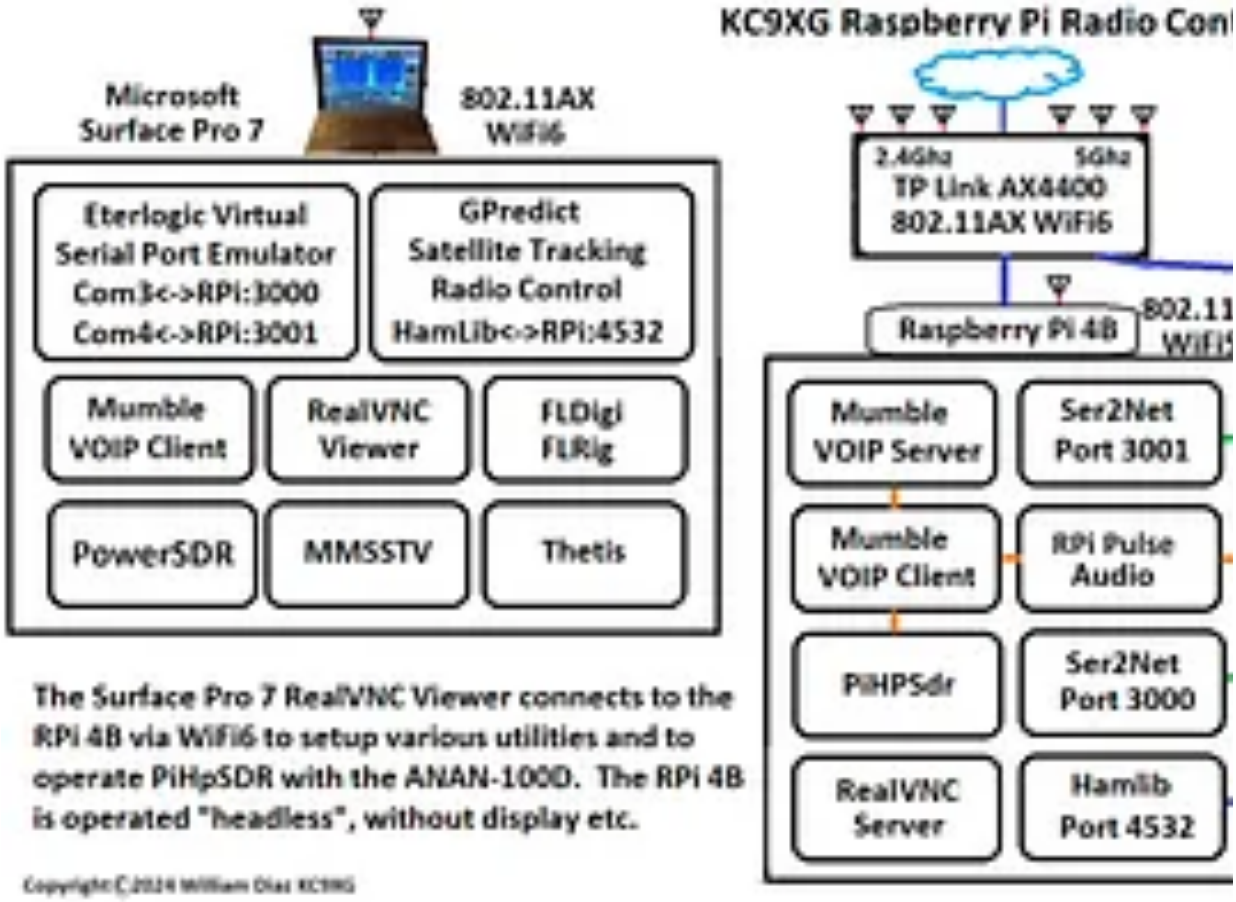
- Designed for Amateur Radio use,
- Use TCP/IP natively for user access and network access,
- Have no "front panel" other than for basic troubleshooting / status data; they are managed and used remotely from a web browser or other control applications.

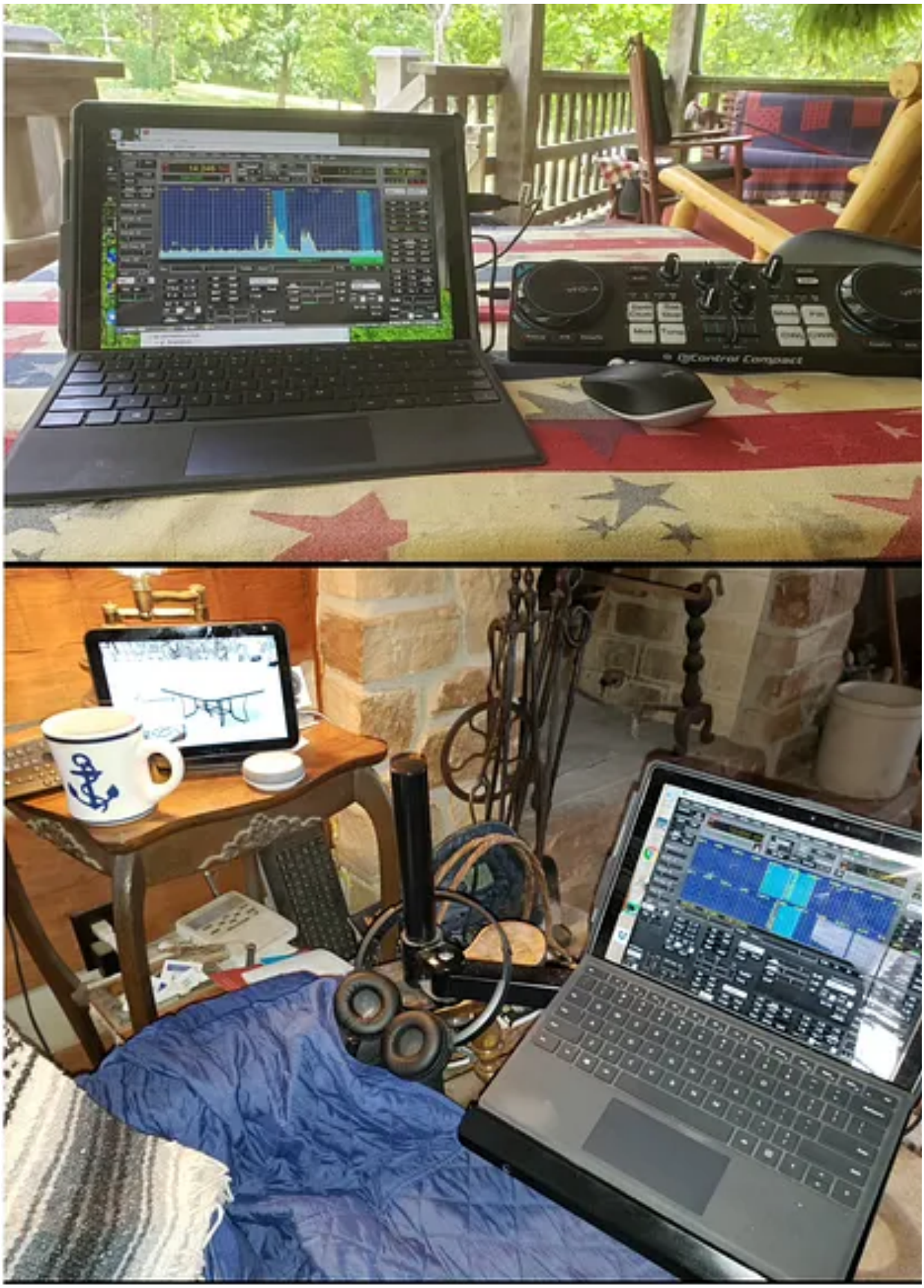
Thus "the operate Amateur Radio from the couch" is trivial, as it's no different from using Internet applications. such as Internet Relay Chat (IRC), email, web browsing, etc.

Bill Diaz KC9XG's Data Appliance (Way Ahead of my Speculations)

Bill Diaz KC9XG was *way ahead* of my speculations about data appliances with *his* implementation of the Data Appliance concept. KC9XG sent me a series of emails and detailed explanations of his decoupled Amateur Radio system, which he built several years ago and uses daily.

> Here is a block diagram and photo of my Raspberry Pi based data appliance - no coding, no soldering, uses off the shelf devices. My favorite operating positions are within 12' of the AX4400 WiFi router. No dropped packets using 5Ghz.
>
> The important point is that while the Raspberry Pi family provides simple, inexpensive devices useful for creating "Data Appliances", my Data Appliance is *only one version* of how to accomplish this. Others may use Raspberry Pi with other tools and methods to create an even more robust and versatile Data Appliances.


KC9XG Raspberry Pi Radio Con
Microsoft
Surface Pro 7
802.11AX
WiFi6
Eterlogic Virtual
Serial Port Emulator
Com3<->RPi:3000
Com4<->RPi:3001
GPredict
Satellite Tracking
Radio Control
HamLib<->RPi:4532
Mumble
VOIP Client
RealVNC
Viewer
FLDigi
FLRig
PowerSDR
MMSSTV
Thetis
2.4Ghz
5Ghz
TP Link AX4400
802.11AX WiFi6
Raspberry Pi 4B
802.11
WiFi
Mumble
VOIP Server
Ser2Net
Port 3001
Mumble
VOIP Client
RPi Pulse
Audio
PiHPSdr
Ser2Net
Port 3000
RealVNC
Server
Hamlib
Port 4532
The Surface Pro 7 RealVNC Viewer connects to the
RPi 4B via WiFi6 to setup various utilities and to
operate PiHpSDR with the ANAN-100D. The RPi 4B
is operated "headless", without display etc.
Copyright © 2024 William Diaz KC9XG



Clearly KC9XG *completely* embraces the Data Appliance concept… especially the *comfortable operating position*. KC9XG's QRZ page casually mentions:

> Former US NAVY Radioman.

Ahhhh… with *that* background, KC9XG is clearly an expert at systems integration of disparate radio and electronics systems! (Not to mention excellent *documentation skills* illustrating interconnections of disparate radio and electronics systems!)

I was a little hazy about the audio connections of KC9XG's system, and he provided additional detail. Basically, Mumble is a Voice over IP (VOIP) system:

> Open Source, Low Latency, High Quality Voice Chat

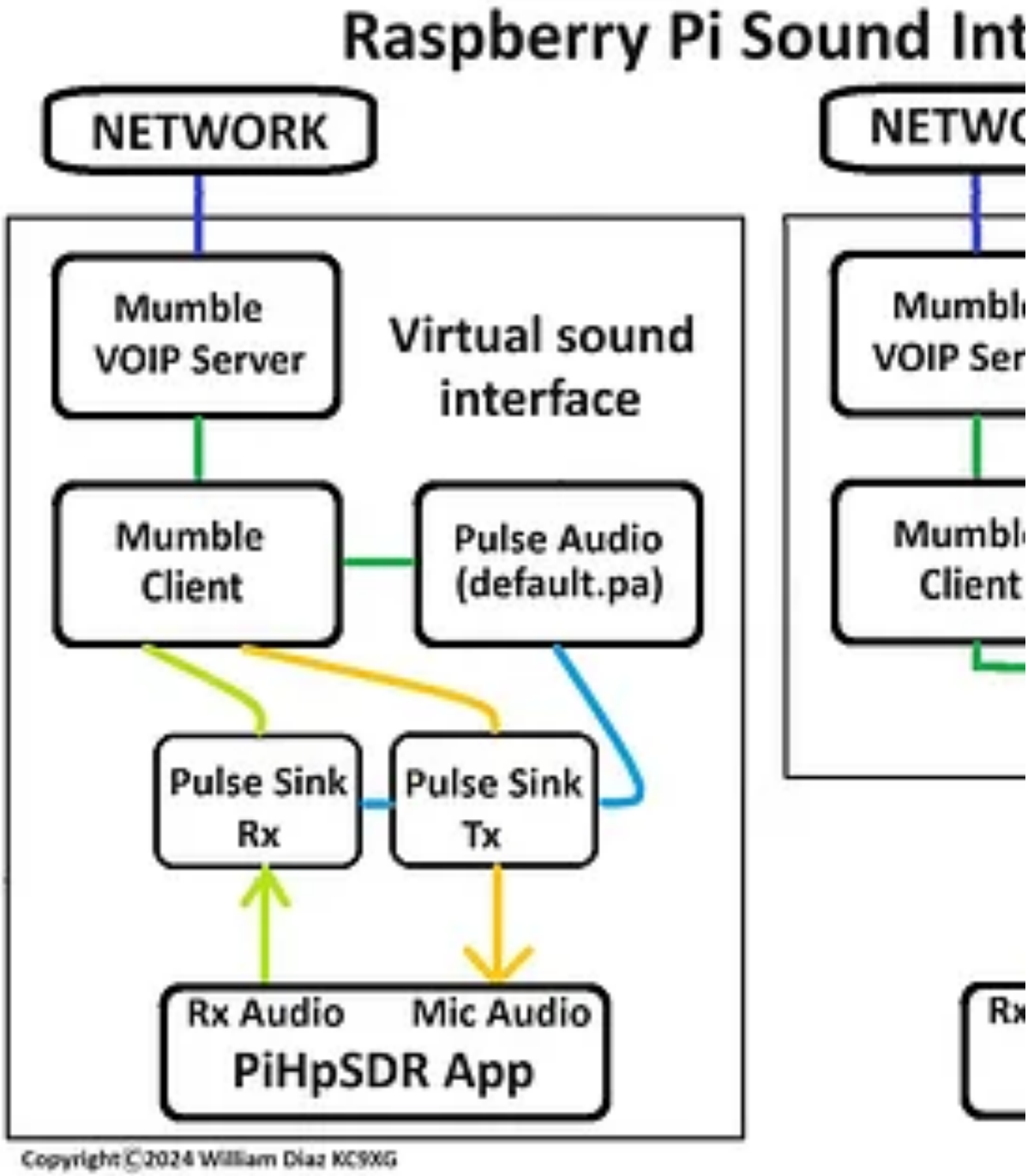
which he uses to virtualize the audio connections by using a Mumble *server* on the Raspberry Pi Radio Controller (the Data Appliance) and a Mumble *client* on the Surface Pro 7.

The physical audio connection on KC9XG's Kenwood TM-D710 is the confusingly labeled "**Data**" connector (6 Pin MiniDIN) that is normally used for connecting an external modem or TNC. The TM-D710 is flexible enough to allow simultaneous use of the built-in TNC (9600 bps FSK or 1200 bps AFSK) and external modems or TNCs, and KC9XG's system both the internal TNC and the external audio capability.

The "Data" connector actually provides *analog* "flat audio" signals for higher speed data modes such as VARA FM or Packet Radio 9600 bps Frequency Shift Keying (FSK) that require flat audio. Despite the "Data" label, this connection is *analog* "flat audio" (no pre-emphasis on audio input, no de-emphasis on audio output) and provides the same audio signals as microphone input or speaker output. You can use this audio connection for data signals… but you don't *have* to.

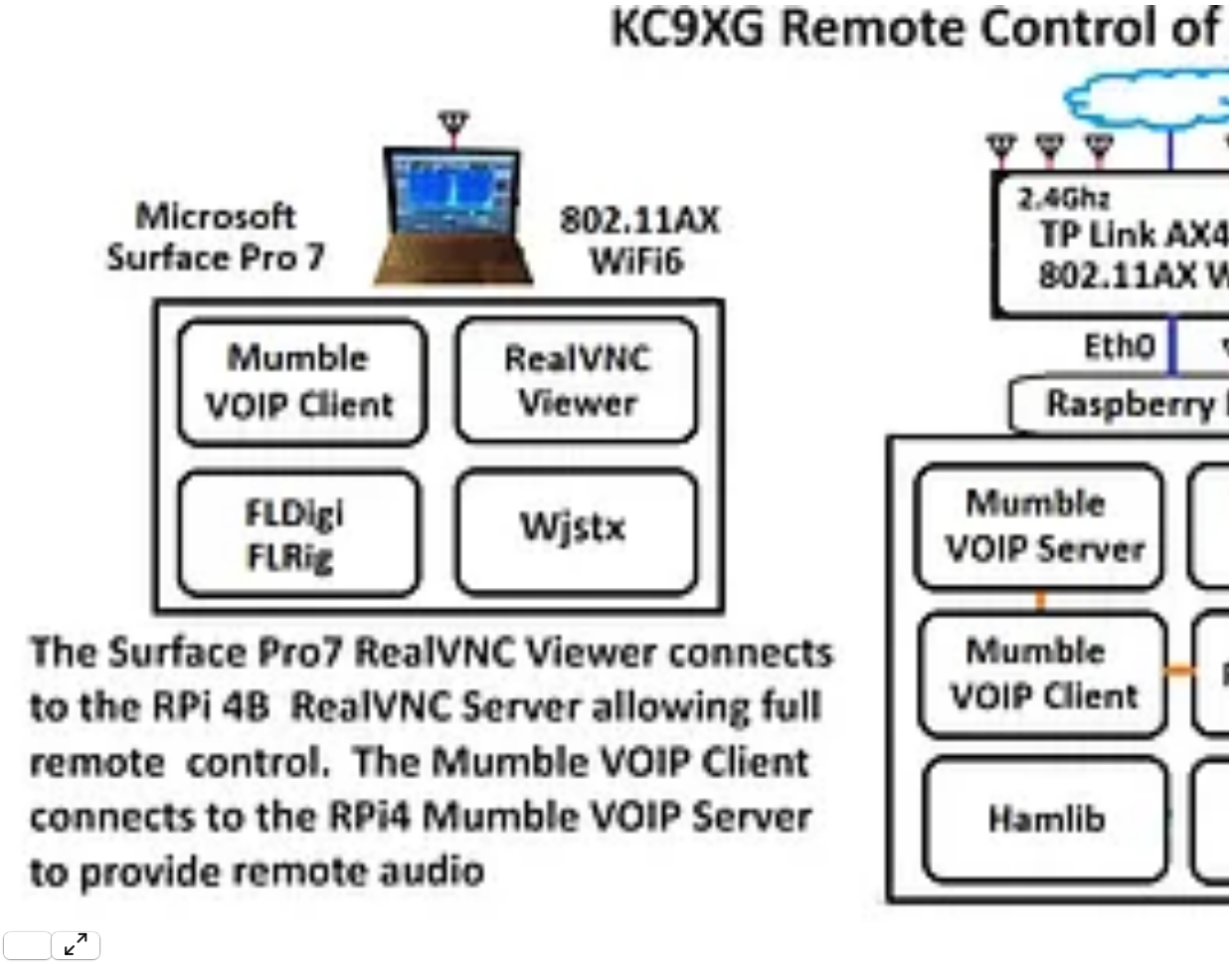
The audio connection on KC9XG's Raspberry Pi Radio Controller (the Data Appliance) is a generic USB audio interface ("sound card") to convert analog audio to / from the radio to digitized audio to / from the Raspberry Pi.

KC9XG offered this additional detail about the audio portions of his system:



My /etc/pulse/default.pa file has 3 sinks added, Rx0, Rx1 and Tx for use with PiHpSDR and ANAN-100D:

- load-module module-null-sink sink_name=RX0 sink_properties="device.description='RX0 Audio"
- load-module module-null-sink sink_name=RX1 sink_properties="device.description='RX1 Audio"
- load-module module-null-sink sink_name=TX sink_properties="device.description='TX Audio"



The applications KC9XG uses, such as FLDigi and WSJT-X run on the Surface Pro 7 which he uses at his "comfortable operating position". Those applications are configured to use the (virtual) audio connections provided by the Mumble client on the Surface Pro 7. The applications don't know that they aren't connecting to a physical audio interface.

This is all the more remarkable from KC9XG's initial statement:

> No coding, no soldering, uses off the shelf devices.

I'm grateful to KC9XG for providing this real world, proven example of the Data Appliance concept for the Zero Retries readership.

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After Docket 16-239 Changes, Use of New Packet Radio May Take Off In The US

By Steve Stroh N8GNJ

Since its inception in ~ 2019, use of New Packet Radio (NPR) has been restricted to its slowest data mode in the US because of antiquated FCC regulations on symbol rates and maximum bandwidth. If those limitations are repealed by the FCC, New Packet Radio systems could quickly become more popular in the US.

To get fully up to speed on New Packet Radio, the (origin) Hackaday article is the most comprehensive, with links to manuals and open source material and numerous updates. An article in IEEE Spectrum provided a good overview from a user's perspective.

Note that at the time NPR (and its documentation) was created, the term "Master" was in widespread use to denote a network unit that manages other network units. That terminology has been deprecated by many, including me. In this article, in direct quotes, the "Master" terminology is retained, but in my text, I'll use the term "hub node".

*Last disclaimer - NPR is no exception that with data communications systems, there are two data rates to be considered - **raw** (over the air) date rate, and **actual throughput** (sometimes stated as "usable") data rate. In this article, I'm choosing to cite the raw (over the air) data rates - it's just more expedient to do so. But please understand that the actual throughput data rate of NPR (70 - 500 kbps) will inevitably be considerably less than the raw data rate (56 kbps - 1 Mbps).*

My friend Steve Monsey N0FPF made the observation that with the likelihood of FCC Amateur Radio rules changes, NPR may get much more popular soon. Upon hearing it, his observation rang true to me. One reason that NPR has a lot of potential in the US is that radios operating in the 420-450 MHz

(70 centimeter) band do not require an optically clear line of sight, as microwave links (AREDN, HamWAN, Part 15) do. While the higher data rates of microwave links are a really nice feature… *some* connectivity at lower speeds, such as NPR offers, is often an acceptable tradeoff to no higher speed connectivity at all (when microwave links aren't feasible).

When I've previously discussed NPR, the "slow speed" issue often comes up. Under current US regulations, use of NPR is limited to 56 kbps raw data rate using a 100 kHz channel in the 420 - 450 MHz (70 centimeters) band. Here is Elekitsorparts' disclaimer for their NPR-70 v05 Modem by F4HDK for potential US users:

> Note for USA: Due to CFR 47 Part 97 FCC regulations, for the 70cm amateur radio band (restriction to 100kHz and 56kBaud), only the setting "modulation 20" of NPR-70 seems to be legal in USA. Please always check your local amateur-radio regulation before buying and using NPR70. Modulation 20: Symbol Rate 50kS/s, bandwidth 100kHz, raw datarate 100kb/s raw, usable datarate 65kb/s.

In discussions I've had regarding NPR, many regard a data rate of "only 56 kbps" as essentially not worth bothering with given that such a system requires an entirely new set of hardware, new systems to learn, and most of all, no existing infrastructure (hub nodes) are yet in place.

But *if the FCC updates its Amateur Radio regulations by removing symbol rate and bandwidth limitations*, NPR could then be used in the US at its maximum data rate of 1 Mbps using a 1 MHz channel, as is the case in many other countries. 56 kbps might not be worth bothering with… but 1 Mbps begins getting some attention.

While many would not consider NPR's 1 bit per Hz data rate to channel size ratio to be very modern, keep in mind that NPR is an open source *system* designed *specifically* for Amateur Radio, and is remarkably affordable for a dedicated data communications system. NPR incorporates all the necessary elements for a data communications system *for operation in Amateur Radio* - appropriate frequency (no modifications needed such as the case with repurposed non-Amateur Radio equipment), regularly identifies transmissions using callsigns, no encryption, and affordability.

Most importantly, and often overlooked, to use a unique data mode (such as NPR) that is not specifically authorized in the FCC Amateur Radio regulations, FCC § 97.309 (a) (4) applies:

> An amateur station transmitting a RTTY or data emission using a digital code specified in this paragraph may use any technique whose technical characteristics have been *documented publicly*, such as CLOVER, G-TOR, or PacTOR, for the purpose of facilitating communications.

At least that is the case with US1 Amateur Radio. As an open source project, not only is the on-air protocol documented publicly, all of the internal operations, and all design files (software, hardware) of NPR are documented publicly.

TCP/IP is the Answer… What Was the Question?

Another strong reason to seriously consider New Packet Radio over other Amateur Radio data communications systems is that it uses TCP/IP technology rather than protocols and interfaces that are unique to Amateur Radio such as AX.25, "KISS", TNCs and modems, etc. One of the largest potential sources of new Amateur Radio Operators is "techies" and especially techies with an Information Technology (IT) background. Such new Amateur Radio Operators will be intimately familiar with TCP/IP and associated software and tools, so using NPR their Amateur Radio experience will be familiar through the use of routers, email, web servers and browsers, chat servers and clients, file transfer and terminal software, etc. Most of their familiar tools and systems will work, natively, with NPR… just a bit slower than they're used to.

Where it's desirable, TCP/IP connectivity from NPR can be "bridged" into Amateur Radio systems through the use of "router software" that provides both TCP/IP and legacy Amateur Radio interfaces, such as Dire Wolf, JNOS and BPQ32 / LinBPQ, and others.

Thus NPR may soon be ripe for widespread use in the US.

Elekitsorparts NPR-70 v05 Modem by F4HDK

Image courtesy of Elekitsorparts.

One issue with NPR in the US is that there currently aren't many NPR hub nodes (equivalent to digipeaters or repeaters) available that make it easier to use the NPR-70 units shown above given that the transmit power is only 0.5 watts. With the losses inherent in typical coaxial cable at 433 MHz, it's a challenge to make simplex connections except in close proximity. It is possible to use an external amplifier, but such amplifiers have to be chosen carefully to be compatible with the "managed Time Division Multiple Access (TDMA) modulation.

Per the NPR Advanced User Guide v2.16, NPR units can be configured for either user or hub node usage:

> 3.1) Protocol – general information
>
> A central radio station, the Master, coordinates all the network. Therefore, the protocol is not designed for "multipoint to multipoint" (full mesh) topologies, 2 clients cannot talk directly. The only way for them to communicate together is via the Master.

Localino New Packet Radio Modem Version 2, NPR-H 2.0

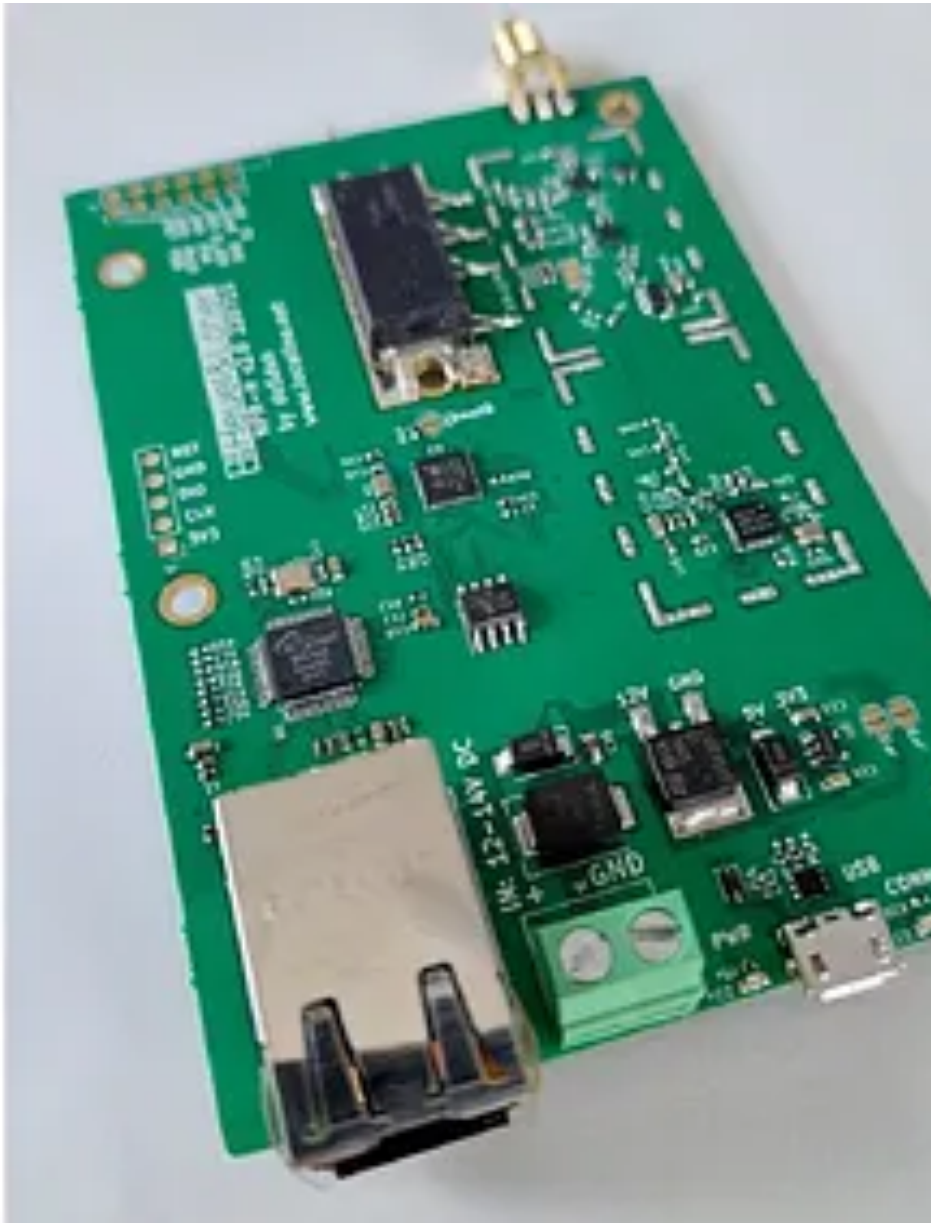

Image courtesy of Location / Tindie

Taking full advantage of all aspects of New Packet Radio being released as open source, Localino has developed their second version of a New Packet Radio unit. The most notable improvement of this unit is that the transmitter outputs a usable 7 watts. It also does not come with an enclosure. Though this unit is a bit more expensive, at US $189, that's well within the price range of a combination of Elekitsorparts NPR-70 v05 plus an external amplifier… and likely far less problematic in making the amplifier work reliably. At a minimum, the Localino unit would be idea of use as a hub node.

I was concerned that the Localino units would not be available if there were a "rush" of orders, but I contacted Localino via the Tindie store and received these replies in several emails from Steffen Heuel DO5DSH of Localino:

> Yes, we can restock and build some more units. Nice that your rules are targeting to use 1 MHz, that creates new use cases!
>
> Just restocked to 3 pieces which I currently have in the office. then we need to run the SMT machine again. Would also be no problem.
>
> Its the typical chicken and egg thing, how many pieces do you assemble, who uses it, does it match the use case etc… But we are pretty flexible as we do from engineering to assembly, therefore its mainly "time" what costs.

I suspect the word is getting out about the Localino version of NPR. As I compose this article, Tindie is currently out of stock of these units, down from the three units restocked during the previous week. But apparently… *they'll make more*. If you want a pair (you'll need at least two for your experimentation), just contact Localino through the Tindie store by clicking on the "Ask a question" link (you'll need to create a Tindie account, a reasonable anti-bot measure) and tell them you'd like to purchase a pair. When there is enough interest expressed to justify at least a small production run, Localino will order more PCBs and components and fire up their pick and place machine to build more NPR units.

Future / Potential NPR Enhancements

NPR is a good, usable system as it is now, but it could be made better… literally *could* be made better *because it is open source*. The current implementation was designed to use simple and inexpensive hardware and thus has issues such as low transmit power and poor receive sensitivity. But the main issue is that an NPR hub node can only accommodate a limited number of simultaneous users:

> Currently, the protocol is limited to 7 simultaneous clients for 1 Master (evolution planned to 15 clients). Therefore, you should always disconnect (switch off or radio off mode) a client modem which is not in use.
>
> Furthermore, it is bad to maintain a client connection in "fast" mode with the help of a continuous ping or other methods, because it would monopolize radio resource.

I cannot find the reference now, but in my earlier research on NPR, I think I read that a software update to NPR now "times out" unused user sessions and thus the limitation of 7 (or 15) "simultaneous clients" isn't quite so onerous, and manual "switch off or radio off mode" isn't required - that "disconnected" status when a user node doesn't have traffic happens automatically.

Just as the Localino version of an NPR unit updated the original NPR unit to provide a reasonable transmit power level of 7 watts, with some additional development work, NPR could likely be extended to accommodate more simultaneous users. It's my guess that accommodating more simultaneous users is mostly a matter of more compute power and perhaps more granular management of the channel.

One nice feature of NPR is that an NPR hub node on a hilltop, or tower, or other central location would *not require a duplexer* as NPR uses a "single channel" (albeit a much wider channel than is typical in Amateur Radio VHF / UHF - up to 1 MHz). For intense Radio Frequency (RF) environments, a bandpass filter cavity tuned for the NPR hub node's frequency (to reject powerful signals on adjacent frequencies) is probably appropriate. NPR hub nodes would also not require *coordination as a repeater*, as a single channel system does not meet the definition of a repeater.

Another nice feature of about NPR is that it can operate anywhere within 420 - 450 MHz. Thus in areas of the US where all 30 MHz is available for use (South of "Line A"), there's probably "plenty of room in the band" for high profile NPR hub nodes, or probably *multiple* NPR hub nodes on the same site. For multiple NRP hub nodes at the same site, NPR has an interesting capability:

> 3.5) Radio Network ID
>
> The « radio network ID » is equivalent to CTCSS for our UHF or VHF FM repeaters.
>
> If 2 NPR networks (1 master plus several clients) are in the same area, and the same frequency (or close frequency), they should use different "Network ID" values. The goal is to avoid that one network listens to the other network.
>
> Without this mechanism, one modem can lose lots of radio frames dedicated to it in reception, because it could have begun to decode radio frames from the other network.
>
> All the modems of one network (Master and client) will use the same "radio network ID value".
>
> Of course, this mechanism cannot solve interference issues, in case of 2 networks located very close.

On a very high profile site, I can imagine that Radio Network ID would be a very handy feature for segmenting different NPR networks on multiple NPR hub nodes such as using vectorized antennas.

Another potential variation for NPR thanks to its open source design is the possibility of a variant for the US 219-220 MHz and the 222-225 MHz bands. If the FCC removes the bandwidth limit (currently 100 kHz) of the 219-220 MHz band, an "NPR-220" unit would be ideal for use in this band in the (required operation) point-to-point links, and NPR hub nodes operating in 222-225 MHz.

Yet another potential enhancement of NPR would be to implement Internet Protocol version 6 (IPv6). Use of IPv4 is rapidly aging out because all available IPv4 addresses have been allocated, and the only way to get a new "routable" IPv4 address or especially block of IPv4 addresses is to reassign existing IPv4 address and block allocations. This is less of an issue for Amateur Radio systems because 44Net exists to allocate a pool of 12 million (formerly 16 million) IPv4 addresses for Amateur Radio and research use. IPv4 is the past and perhaps the present (for a few more years), but IPv6 is the present and future. NPR is a new enough system that it likely wouldn't be too disruptive to change over from IPv4 to IPv6.

Summary

With the likelihood of more flexible FCC rules for the US Amateur Radio VHF / UHF bands, New Packet Radio is worth another look as a next generation Amateur Radio data communications system, especially in situations where microwave links aren't feasible.

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ZR > BEACON

By Steve Stroh N8GNJ

Short mentions of Zero Retries Interesting items.

Bob Witte K0NR is a new ARDC Director

Bob Witte K0NR is a new member of the ARDC Board of Directors. In contrast to previous new members of the ARDC Board, K0NR is not replacing an existing director, nor is this a shuffling of existing members into new positions. Commendably, ARDC added K0NR as an *additional director position*, which I think is a great idea.

I worked with K0NR during the two years I was on the ARDC Grants Advisory Committee (GAC) and he earned my respect and admiration for his work there. K0NR was unfailingly organized, deeply involved, and completely reliable in his work with the GAC, and thus I think the ARDC board is gaining a

lot of talent in K0NR.

Most importantly for ARDC, the addition of K0NR as an ARDC director *will add some new perspective* of a *very* ***active***, *very* ***involved***, *and very* ***experienced and knowledgeable Amateur Radio Operator*** to the ARDC Board of Directors.

Congrats Bob!

New Product - SDRPlay RSP1B Software Defined Receiver

> The RSP1B is an enhanced version of the RSP1A our popular lowest cost receiver—it is a powerful wideband full featured 14 bit SDR and perfect as an all round general coverage communications receiver plus much much more.
>
> The key advantages over the RSP1A are that it comes in strong black painted steel case instead of plastic, and (compared to the RSP1A) has significantly improved noise performance below 1MHz (i.e for LF and below), and in the 50-60 MHz region. There are also noticeable noise improvements in the 3.5-5.5MHz and 250-320MHz spectrum. It also has it has improved signal handling at HF frequencies compared to the RSP1A.

There is a detailed data sheet for the RSP1B.

The two key features of the RSP1x units, to me are:

- Covers all frequencies from 1kHz through VLF, LF, MW, HF, VHF, UHF and L-band to 2GHz, with no gaps
- Receive, monitor and record up to 10MHz of spectrum at a time

It's interesting that one of the improvements in the RSP1B is the noise performance in 50-60 MHz, which covers the 50-54 MHz (6 meters) Amateur Radio band. Thus the RSP1B unit would seem to make a great 50-54 MHz receiver for use with a hybrid or cross-band repeater system that transmits on 50-54 MHz.

VADCG's Newsletter "the packet" Now Online

The Vancouver Amateur Digital Communications Group (VADCG) and their kits for what we now call Terminal Node Controllers was one of the formative groups that created Amateur Radio Packet Radio - predating TAPR and its TNC-1 and TNC-2.

Allen Mar VE7DPM has some of VADCG's newsletter "the packet" in his collection. VE7DPM has now digitized some issues of "the packet" and uploaded them to Internet Archive's Digital Library of Amateur Radio & Communications (DLARC). In cooperation with Kay Savetz K6KJN, those issues of "the packet" are now available online. VE7DPM's experience illustrates the synergy of an individual digitizing items in their collection (and retaining them) but working with DLARC to make them publicly available. In particular, K6KJN advised VE7DPM on best digitizing practices compatible with IA / DLARC:

> Please scan your documents at 600 DPI PNG or TIFF - both formats are lossless. Please scan in greyscale (or color if there is color content) but not in black and white.

With that digitizing resolution, Internet Archive can render the scans into a number of more usable formats, such as:

- CHOCR
- COMIC BOOK ZIP
- EPUB
- FULL TEXT

And several other formats. I find the PDF versions to be the most useful.

"the packet" is just one of *many* Amateur Radio technical newsletters and magazines that are now available for self-education within DLARC. While the details of technologies used in Amateur Radio have changed, many of the *concepts* have not. Many concepts have been proposed in Amateur Radio that were "ahead of their time", and didn't get implemented, or implemented widely because the concept was too expensive, too audacious, or too challenging for the technology of the time. Now many, perhaps most such concepts are now entirely practical (with low cost powerful embedded processors and Software Defined Radio). These "ahead of their time" concepts are waiting to be rediscovered by Amateur Radio technologists of the mid-2020s to be implemented with the *technologies of the mid-2020s*.

HamOpen.org Update

It's been a while since there's been an update from HamOpen.org. The following was an email apparently to all current HamOpen.org members, which has (to date) not been posted on their website. There were enough Zero Retries Interesting mentions in the email that it's expedient to "reprint" the entire email.

> Dear HamOpen.org members,
>
> Please renew your membership via this link. If you wish you can find the same link at the HamOpen.org web site. There are also links for additional contributions at the web site.
>
> We have a lot of news!
>
> We will be exhibiting at Orlando Hamcation on February 9-11. We are showing FreeDV and M17 at booths 64-65 in the main building.

> Hamcation kindly moved us to an end-cap double-wide booth from the double-wide in the middle of an aisle that we had. This is a great high-traffic location. Meet me in the booth or text **[redacted]** to find me at the show.
>
> HamOpen.org has a 501(c)3 fiscal sponsor, so your donations are now tax deductible (and past ones are as well - due to the IRS 2-year window for new non-profits to get their 501(c)3 status). Our sponsor is *Non-Profit Accounting Service*. A fiscal sponsor is a 501(c)3 non-profit organization that helps other non-profits with the government, tax, and clerical load of running the organization, without requiring them to go through the 501(c)3 process themsleves (although we probably eventually will), so that we can focus on its operations.
>
> Every non-profit or fiscal sponsor has overhead, because running a non-profit includes a lot of tax documentation, bookkeeping, etc. Ours charges 5% of revenue and $50/month, and provides a CPA to do essentially all of the paperwork of keeping the organization afloat and legal. This is lower than other fiscal sponsors or what it would cost to do the work on our own. Having attempted to do this work with volunteers in a number of organizations, I'm really glad to hand it over to a pro.
>
> This provides us with some advantages that we can pass on to you. If you would like to go for a grant for an Amateur Radio project, we can handle the grant administration for you. Many ham radio clubs and some Open Source projects we work with, like M17, have gone for grants from ARDC. We also have access through GrantWatch to reach other grant sources.
>
> We've requested two grants from ARDC: one is to support our exhibiting Open Source for Amateur Radio at four high-traffic Hamfests yearly (I've been paying almost all expenses personally up to now), and to sponsor my keynotes at Open Source conferences (distant ones cost around $2000 for travel and lodging and if I wasn't reimbursed, that too came out of my pocket). The second is to sponsor development of Post-Open, a path forward for Open Source (see this article in The Register).
>
> I've recovered from my heart attack and double-bypass in November 2022, and I feel great! If you've been following my work on the $14 remote rig controller, I'm working on the final stage of that: a web-based general station control system that is so awesome that I think it will take over remote ham radio entirely, and a lot of non-ham device control applications. It's not ready for display by Hamcation - it should be there by Hamvention. My other personal project is continued work on my remote ham site, you can see the slides from my presentation on it here.
>
> Please feel free to email any time you have questions. I hope to see you at Hamcation, or later at Hamvention.
>
> Thanks
>
> Bruce Perens K6BP

The HamOpen.org / K6BP "$14 remote rig controller" sounds like it could also be used as another Data Appliance. K6BP's mention that HamOpen.org is willing to act as a fiscal sponsor is another alternative to working with organizations such as TAPR or Open Research Institute to as a fiscal sponsor for projects. K6BP's mention of the Non-Profit Accounting Service was also very interesting and might be a good alternative for a project having to incorporate as a formal organization and obtain their own IRS 501(c)(3).

Leave a comment

Share

Feedback Loop

Zero Retries 0136 Email Comments

My friend Larry Gadallah NM7A sent this email about **Zero Retries 0135**, How to see 56 MHz of bandwidth...

> Doh! Oops, another violation of Nyquist's sampling theorem: A device sampling at 61.44 MSPS could, at best, only represent signals with a frequency of up to one half of that rate, or 30.72 Mhz. It does *not* translate into a "bandwidth of 56 MHz".

Good point! Thanks for pointing that out Larry!

Zero Retries 0136 Comments

My thanks to Ben Kuhn, Alan Beard, ReadyKillowatt, and K4HCK Cale for their great comments on Zero Retries 0136.

If you provide feedback via email, I may excerpt your feedback or include it in full. Unless you specifically grant me permission to include your name, I won't do so. Feedback may be lightly edited for clarity.

Join the *Fun* on Amateur Radio

If you're not yet licensed as an Amateur Radio Operator, and would like to join the fun by *literally having a license to experiment with radio technology*, check out
Join the Fun on Amateur Radio for some pointers.

Zero Retries Frequently Asked Questions (FAQs) — In development 2023-02.

Closing the Channel

In its mission to highlight technological innovation in Amateur Radio, promote Amateur Radio to techies as a literal license to experiment with radio technology, and make Amateur Radio more relevant to society in the 2020s and beyond, Zero Retries is published via email and web, and is available to

everyone at no cost. Zero Retries is proud *not to participate* in the Amateur Radio Publishing Industrial Complex, which hides Amateur Radio content behind paywalls.

My ongoing ***Thanks*** to:

- Tina Stroh KD7WSF for, well, *everything!*
- ***Founding Members*** **who generously support Zero Retries financially:**
  Founding Member 0000 - Steven Davidson K3FZT
  Founding Member 0001 - Prefers to Remain Anonymous 01

  Founding Member 0002 - Chris Osburn KD7DVD
  Founding Member 0003 - Don Rotolo N2IRZ
  Founding Member 0004 - William Arcand W1WRA
  Founding Member 0005 - Ben Kuhn KU0HN
  Founding Member 0006 - Todd Willey KQ4FID
  Founding Member 0007 - Merik Karman VK2MKZ
  Founding Member 0008 - Prefers to Remain Anonymous 14
  Founding Member 0009 - Prefers to Remain Anonymous 19
- Numerous Annual and Monthly subscribers who also generously support Zero Retries financially!

Want to Support Zero Retries?

- The *most* effective way to support Zero Retries is to simply mention Zero Retries to your co-conspirators that are also interested in knowing more about technological innovation that is occurring in Amateur Radio and encourage them to become a fellow subscriber.
- One particularly effective method of promoting Zero Retries is to add a mention of Zero Retries to your QRZ page (or other web presence) and include a link:

  https://www.zeroretries.org
- If you'd like to financially support Zero Retries, becoming a paid subscriber is *greatly* appreciated and helps offset expenses incurred in publishing Zero Retries. Paid subscriptions for Zero Retries are *entirely optional*, as explained in this special issue of ZR:
  Zero Retries Administrivia - Activating Payment Options.

These blogs and newsletters regularly feature Zero Retries Interesting content:

- Dan Romanchik KB6NU mentions "Zero Retries Interesting" topics so regularly on his blog (that I otherwise wouldn't know about) that I've bestowed on him the honorific of Pseudostaffer.
- Jeff Davis KE9V also mentions "Zero Retries Interesting" topics so regularly on his blog (that I otherwise wouldn't know about) that I've bestowed on him the honorific of Pseudostaffer.
- Amateur Radio Weekly by Cale Mooth K4HCK is a weekly anthology of links to interesting Amateur Radio stories.
- Experimental Radio News by Bennet Z. Kobb AK4AV discusses (in detail) Experimental (Part 5) licenses issued by the US FCC. It's a *must-read-now* for me!
- RTL-SDR Blog - *Excellent* coverage of Software Defined Radio units.
- TAPR Packet Status Register has been published continuously since 1982.
- Other Substack Amateur Radio newsletters recommended by Zero Retries.

These YouTube channels regularly feature Zero Retries Interesting content:

- HB9BLA Wireless by Andreas Spiess HB9BLA
- KM6LYW Radio by Craig Lamparter KM6LYW (home of the DigiPi project)
- Modern Ham by Billy Penley KN4MKB
- Tech Minds by Matthew Miller M0DQW

Zero Retries is currently using the Substack email publishing platform to publish Zero Retries. It's particularly suitable for small newsletters as you can get started for no cost.

If you're reading this issue on the web and you'd like to see Zero Retries in your email Inbox every Friday afternoon, just click below to join ***1200+*** other subscribers:

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If you're a fellow smart person that uses **RSS**, there *is* an **RSS feed for Zero Retries**.

Zero Retries (N8GNJ) is on Mastodon — n8gnj@mastodon.radio — just click:

Zero Retries / N8GNJ on Mastodon

Email issues of Zero Retries are "instrumented" by Substack to gather basic statistics about opens, clicking links, etc.

More bits from Steve Stroh N8GNJ:

- SuperPacket blog — *Discussing new generations of Amateur Radio Data Communications — beyond Packet Radio (a precursor to Zero Retries)*
- N8GNJ blog — *Amateur Radio Station N8GNJ and the mad science experiments at N8GNJ Labs — Bellingham, Washington, USA*

Thanks for reading!
Steve Stroh N8GNJ / WRPS598 (He / Him / His)
These bits were handcrafted (by a mere human, not an Artificial Intelligence bot) in beautiful Bellingham (The City of Subdued Excitement), Washington, USA, and linked to the Internet via **Starlink *Satellite* Internet Access**.

2024-02-02

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Blanket permission granted for TAPR to use any Steve Stroh content for the TAPR Packet Status Register (PSR) newsletter (I *owe* them from *way* back).

1

I'm only able to cite US Amateur Radio regulations; other countries' Amateur Radio regulations may vary.